

REMARKS

This paper is presented in response to the Office Action. By this paper, claim 4 is canceled, claims 1-3, 5-19 and 22-23 are amended, and new claims 24-26 are added. Claims 1-3 and 5-26 are now pending in view of the aforementioned cancellations and new claims.

Reconsideration of the application is respectfully requested in view of the above amendments to the claims and the following remarks. For the Examiner's convenience and reference, Applicant's remarks are presented in the order in which the corresponding issues were raised in the Office Action.

I. General Considerations

Applicant notes that the remarks and amendments presented herein have been made merely to clarify the claimed embodiments from elements purported by the Examiner to be taught by the cited references. Such remarks, or a lack of remarks, and amendments are not intended to constitute, and should not be construed as, an acquiescence, on the part of the Applicant: as to the purported teachings or prior art status of the cited references; as to the characterization of the cited references advanced by the Examiner; or as to any other assertions, allegations or characterizations made by the Examiner at any time in this case. Applicant reserves the right to challenge the purported teaching and prior art status of the cited references at any appropriate time.

In addition, the remarks herein do not constitute, nor are they intended to be, an exhaustive enumeration of the distinctions between any cited references and the claimed invention. Rather, the distinctions identified and discussed herein are presented solely by way of example. Consistent with the foregoing, the discussion herein is not intended, and should not be construed, to prejudice or foreclose contemporaneous or future consideration, by the Applicant, of additional or alternative distinctions between the claims of the present application and the references cited by the Examiner, and/or the merits of additional or alternative arguments.

II. Objection to the Specification

The Examiner has objected to the specification based on an informality. Applicant submits that in view of the amendment to the specification set forth herein, the objection to the specification has been overcome and should be withdrawn.

III. Rejection of Claims 1-23 under 35 U.S.C. § 103

Applicant respectfully notes at the outset that in order to establish a *prima facie* case of obviousness, it is the burden of the Examiner to demonstrate that three criteria are met: first, there must be some

suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings; second, there must be a reasonable expectation of success; and third, the prior art reference (or references when combined) must teach or suggest all the claim limitations. *MPEP* § 2143.

The Examiner has rejected claims 1-23 under 35 U.S.C. § 103(a) as being unpatentable over an article entitled “Enhanced Performance of Offset-Gain High-Barrier Vertical-Cavity Surface-Emitting Lasers”, by Young et al. (“*Young*”) in view of U.S. Patent No. 5,740,191 to Kasper, et al. (“*Kasper*”). Of those claims, claims 1, 8, and 17 are independent claims. For at least the reasons outlined below, Applicant respectfully disagrees with the Examiner and submits that the rejections should be withdrawn.

Young states that it is directed to “a detailed experimental analysis of a VCSEL structure capable of high CW power output.” *Young*, p. 2014, col. 1, para. 1. To determine power capabilities of the VCSEL, *Young* reports on some previous experiments to determine relevant factors and concludes from the results that “[i]t is evident ... that heating of the junction is the limiting factor in the operation of these devices, and that reduction in the heating would significantly improve the power capabilities of the devices.” *Young*, p. 2019, col. 1, para. 2, emphasis added. *Young* states that “[one] way to achieve lower temperatures at the active region is to improve the heat flow away from the device,” such as by “the addition of a heat-sink to the structure.” p. 2019, col. 2, para. 1, emphasis added. Thus, *Young* is directed towards cooling the VCSEL to improve the power capabilities of the VCSEL. *Young* shows an experimental test device that includes a peltier device and a heat sink to accomplish the heat transfer. See Figure 16. As is known in the art, a peltier device is a device that functions as a heat pump, where heat is transferred from one side of the device to the other. See e.g., <http://www.peltier-info.com/info.html>. A heat sink is often used to then remove the heat from the “hot” side of the peltier device. Thus, as presently understood, the peltier device and heat sink of *Young* are used to remove heat from the system and cool the VCSEL.

Regarding independent claim 1, the Examiner asserts that *Young* teaches all of the elements of the claim, but concedes that “*Young* does not teach the heating element to be configured to turn on when the temperature sensor senses a temperature measurement that is below a predetermined value, wherein the predetermined value is determined in relation to the optimal operating temperature of the vertical cavity surface-emitting laser.” Office Action, p. 3, para. 1. The Examiner then alleges that “[i]t would have been obvious ... to combine the laser module of *Young* with the temperature controller of *Kasper* in order to avoid deleterious low temperature effects ... and maintain the higher optimal operating temperature of the laser device regardless of the room temperature.” Office Action, p. 3, para. 1. Emphasis added.

In the rejection, the Examiner equates the peltier device shown in Figure 16 of *Young* to the heating element (we assume the Examiner means “heater”) of claim 1. Office Action, page 3, para. 1. As discussed above however, the peltier device of *Young* is used to cool the VCSEL. Contrary to the assertion of the Examiner then, it would appear that the “heating element” purported by the Examiner to be disclosed in *Young* is actually configured and arranged to cool the *Young* VCSEL, rather than to “transfer heat to the vertical cavity surface emitting laser” as amended claim 1 requires. Applicant thus respectfully submits that the Examiner has not established that *Young* discloses or suggests “a heater configured to transfer heat to the vertical cavity surface emitting laser,” as recited in amended claim 1.

Regarding claim 8, the Examiner asserts that *Young* teaches all of the elements of the claim, but has conceded that “*Young* does not teach a control module that prevents the operating temperature of the VCSEL from falling below a threshold [activation] temperature using a heater to raise the operating temperature to the an optimal [a predetermined] operating temperature.” As in the case of claim 1, the Examiner then goes on to assert that “[i]t would have been obvious ... to combine the laser module of *Young* with the temperature controller of Kasper in order to avoid deleterious low temperature effects ... and maintain the higher optimal operating temperature of the laser device regardless of the room temperature.” Emphasis added. As similarly discussed above in connection with claim 1 however, the Examiner has not established that *Young* discloses or suggests “a control module that prevents the operating temperature of the VCSEL from falling below an activation temperature using a heater to raise the operating temperature [of the VCSEL] to the predetermined operating temperature” (emphasis added) as recited in amended claim 8.

Regarding independent claim 17, the Examiner similarly asserts that *Young* teaches all of the elements of the claim, but concedes that “*Young* does not teach switching the heating element on and off based on a value of the operating temperature received from the temperature sensor, wherein the control module turns the heating element on when the operating temperature reaches a threshold temperature that is below the optimal operating temperature and wherein the control module turns the heating element off when the operating temperature is close to or exceeds the optimal operating temperature.” Office Action, p. 8, para. 1. The Examiner then alleges that “[i]t would have been obvious ... to combine the laser module of *Young* with the temperature control of *Kasper*” for the same reason as given in reference to claims 1 and 8. Office Action, p. 8, para. 1. For substantially the same reasons set forth above with regard to claim 1, Applicant submits that the Examiner has not established that *Young* discloses or suggests “a heating element to selectively transfer heat to the VCSEL” (emphasis added) as recited in amended claim 17.

Thus, even if the references are combined in the purportedly obvious fashion, the resulting combinations nonetheless fail to include either “a heater configured to transfer heat to the vertical cavity surface emitting laser” (as recited in amended claim 1) in combination with the other limitations of claim 1 and its corresponding dependent claims 2-7, a “control module that prevents the operating temperature of the VCSEL from falling below an activation temperature using a heater to raise the operating temperature to the a predetermined operating temperature” (as recited in amended claim 8) in combination with the other limitations of claim 8 and its corresponding dependent claims 9-16, or a “heating element to selectively transfer heat to the VCSEL” (as recited in amended claim 17) in combination with the other limitations of claim 17 and its corresponding dependent claims 18-23.

Not only are the assertions of the Examiner concerning the teachings of *Young* inconsistent with the apparent disclosure of *Young*, but Applicant furthermore respectfully submits that, in any event, there is not motive to make the purportedly obvious combinations advanced by the Examiner.

By way of example, Applicant respectfully submits there would have been no motivation for one skilled in the art to combine the heating control circuit of *Kasper* with the peltier device of *Young* in the manner asserted by the Examiner. According to the Examiner, one would use the controller of *Kasper* to “avoid deleterious low temperature effects and maintain the higher optimal operating temperature of the laser device regardless of the room temperature.” As discussed above however, *Young* purports to disclose a system for cooling a VCSEL so as to improve the power capabilities of the VCSEL. Heating the VCSEL of *Young* would have an opposite effect of cooling, and would thus be contrary to the stated purpose of *Young*. In view of the fact that *Kasper* is directed to heating a VCSEL, while, in contrast, *Young* is directed to cooling the VCSEL, there would have been no reason for one of skill in the art to combine the references in the purportedly obvious fashion advanced by the Examiner.

Moreover, there is no reasonable expectation that the combinations proposed by the Examiner would prove to be successful. For example, because the peltier device of *Young* is configured and arranged to providing a cooling effect relative to a VCSEL, the control circuit of *Kasper* would not change the fundamental operation of the *Young* device. That is, the control circuit of *Kasper* simply would not work with the *Young* device because the peltier device of *Young* is configured and arranged to cool the VCSEL, and addition of the *Kasper* control circuit would not change the fundamental operational characteristics of that peltier device.

In view of the foregoing, Applicant respectfully submits that the Examiner has not established a *prima facie* case of obviousness with respect to claims 1, 8 and 17, at least because even if the references are combined in the purportedly obvious fashion, the resulting combinations fail to include all the limitations of the rejected claims, and because the Examiner has not established the existence of a

suggestion or motivation to make the purportedly obvious combinations and, finally, because even if the purportedly obvious combinations were implemented, it is not at all apparent that there is a reasonable expectation that such combinations would be successful. Applicant thus respectfully submits that the rejection of claims 1, 8 and 17 should be withdrawn.

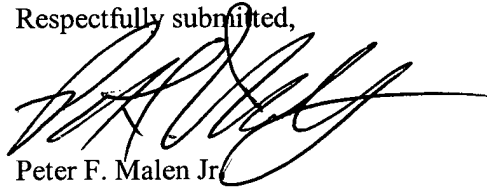
Inasmuch as claims 2-7 depend from claim 1, and thus include all the limitations of claim 1, Applicant submits that the Examiner has likewise failed to establish a *prima facie* case of obviousness with respect to claims 2-7. Similarly, because claims 9-16 depend from claim 8, and thus include all the limitations of claim 8, Applicant submits that the Examiner has likewise failed to establish a *prima facie* case of obviousness with respect to claims 9-16. Finally, because claims 18-23 depend from claim 17, and thus include all the limitations of claim 17, Applicant submits that the Examiner has likewise failed to establish a *prima facie* case of obviousness with respect to claims 18-23. Accordingly, Applicant respectfully submits that the obviousness rejections of claims 2-7, 9-16, and 18-23 should also be withdrawn.

CONCLUSION

In view of the remarks submitted herein, Applicant respectfully submits that each of the pending claims 1-3 and 5-26 now pending in this application is in condition for allowance. Therefore, reconsideration of the rejections is requested and allowance of those claims is respectfully solicited. In the event that the Examiner finds any remaining impediment to a prompt allowance of this application that could be clarified in a telephonic interview, the Examiner is respectfully requested to initiate the same with the undersigned attorney.

Dated this 27th day of January, 2006.

Respectfully submitted,



Peter F. Malen Jr.
Attorney for Applicants
Registration No. 45,576
Customer No. 022913
Telephone: (801) 533-9800